VNC® Viewer Plus

User Guide

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About This Guide

This User Guide explains how to use *VNC Viewer Plus* to connect to and control a 2010 Intel Core vPro host computer running *AMT Server*.

Note: For version information, see *Getting VNC Viewer Plus ready to use* on page 8.

Intended audience

This User Guide has two audiences in mind:

- Chapter 1 through 3 are intended for *VNC Viewer Plus* users.
- Chapter 4 is intended for administrative users with sufficient privileges to configure the host computer running *AMT Server*.

Conventions

Most dialogs and other artifacts are identified by the operating system under which graphics were captured. The default for generic dialogs is Windows XP. Note that error messages, icons, and partial dialogs are not identified.

Services

You can e-mail RealVNC Support if you have a full or trial license to use *VNC Viewer Plus*. At the time of publication, this service is available from www.realvnc.com/support/index.html.

Related information

Navigate to www.realvnc.com for:

- Supported operating systems and system requirements.
- Instructions on how to install, unlock, and remove *VNC Viewer Plus*, and how to get a trial license key.
- Release Notes and FAQs.
- Information relating to other RealVNC products and solutions.

Note: Once *VNC Viewer Plus* is installed, you can go straight to the *VNC Viewer Plus* home page from the **Start** menu. Select **RealVNC > Documentation > VNC Viewer Plus on the Web**.

1

Introducing VNC Viewer Plus

This chapter introduces *VNC Viewer Plus*: what it is, how it works, and how it can help you.

It explains what you need to do to get *VNC Viewer Plus* ready to use in your environment, and suggests, for users with different requirements, what chapters of this User Guide to read next.

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What is VNC Viewer Plus?

VNC Viewer Plus is a premium, dual-mode version of *VNC Viewer* integrated into *VNC Enterprise Edition* 4.5.

You can use *VNC Viewer Plus* to connect to and control:

- A host computer running *VNC Enterprise Edition* or *VNC Personal Edition* (or any VNC-compatible Server), in exactly the same way as *VNC Viewer*. Once connected, you see the desktop of the host computer in a new window, and can control it using your keyboard and mouse.

  In this mode, *VNC Viewer Plus* behaves identically to *VNC Viewer*. Providing the latest version of *VNC Enterprise Edition* or *VNC Personal Edition* is installed on the host computer, advanced features such as printing, file transfer, copy and paste, and *VNC Chat* are available. For more information, see the *VNC Enterprise Edition User Guide*.

- A host computer running *AMT Server*, a proprietary version of *VNC Server* embedded in the 2010 Intel Core vPro processor family.

  In this mode, the host computer need not have a functioning operating system, or even be powered on. You can connect in any state and power the host computer on, wake it from hibernate mode, configure the BIOS, or even boot from an ISO image stored on your client computer. All the while, video output from the host computer is displayed in a window on your desktop, and you can control it using your keyboard and, where permitted, mouse. Once an operating system is booted, you see the desktop of the host computer, and can control it in the normal way.

  Note that, for connections to *AMT Server*:

  — Only one *VNC Viewer Plus* user can connect at a time.

  — File transfer, printing, copy and paste, and *VNC Chat* are not available.

  — A reverse connection cannot be made from *AMT Server* to *VNC Viewer Plus*.

Getting VNC Viewer Plus ready to use

This User Guide assumes you are connecting from a client computer running *VNC Viewer Plus* 1.0 to a 2010 Intel Core vPro host computer running *AMT Server* embedded in Intel AMT major version 6.

To establish a connection, the following operations must be performed on the host and client computers.

Host computer

If you have access to the host computer and sufficient privileges, perform the following operations. If you do not have access, contact your system administrator or a host computer user.

1. Ensure the host computer is connected to a power supply unless it has an independent power source (for example, a laptop), although the host computer need not be powered on.
2. Ensure the host computer is connected to a network to which the client computer is also connected. This document assumes you are connecting over a private network such as a LAN or VPN, but if you are connecting over the Internet, see also *Connecting over the Internet* on page 17.

3. Ensure *AMT Server* is enabled on the host computer. For more information, see *Chapter 4, Configuring the host computer* on page 37.
4. You need to know a network address for *AMT Server*. For more information, see *Discovering a network address* on page 39.
5. Ensure the keyboard language of the host computer is mapped to the type of keyboard attached to your client computer. Note you can configure this after you connect. For more information, see *Controlling the host computer using your keyboard* on page 23.

Client computer

Perform the following operations on your client computer:

1. Ensure *VNC Viewer Plus* is installed and licensed. To see how to do this, and for information on trial license keys, navigate to the appropriate section of the RealVNC web site.

   Note: *VNC Viewer Plus* need not be licensed to make standard VNC connections.
2. Ensure your client computer is not protected by a proxy server. See *Connecting via a proxy server* on page 18 for more information.

What to read next

To walk through making a connection from a client computer running *VNC Viewer Plus* to a host computer running *AMT Server*, see *Chapter 2, Getting Connected* on page 11.

To learn how to use features of *VNC Viewer Plus* to control a host computer running *AMT Server*, including mission-critical operations such as powering on or mounting an ISO image, read *Chapter 3, Using VNC Viewer Plus* on page 21.

To learn how to configure the host computer for *AMT Server*, see *Chapter 4, Configuring the host computer* on page 37.

Note: For information about using *VNC Viewer Plus* to make standard VNC connections to host computers running *VNC Enterprise Edition* 4.5 or *VNC Personal Edition* 4.5, read the *VNC Enterprise Edition User Guide*.

2

Getting Connected

This chapter explains how to connect from a client computer running *VNC Viewer Plus* to a host computer running *AMT Server*.

Note: For information about using *VNC Viewer Plus* to make standard VNC connections to host computers running *VNC Enterprise Edition* 4.5 or *VNC Personal Edition* 4.5, read the *VNC Enterprise Edition User Guide*.

This chapter assumes both host and client computers are set up correctly. For more information, see *Getting VNC Viewer Plus ready to use* on page 8.

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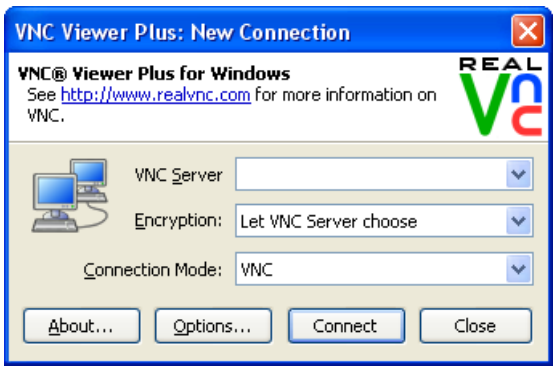
Step 1: Starting VNC Viewer Plus on the client computer

To start *VNC Viewer Plus* on the client computer, select **RealVNC > VNC Viewer Plus** from the **Start** menu. The **VNC Viewer Plus: New Connection** dialog opens:



(Windows XP)

Note: If the **Connection Mode** dropdown is not visible, *VNC Viewer Plus* is unlicensed. You cannot connect to *AMT Server* until you enter a license key. See *Getting VNC Viewer Plus ready to use* on page 8 for more information.

Step 2: Configuring VNC Viewer Plus before you connect

In most circumstances, *VNC Viewer Plus* is ready to connect to *AMT Server* out-of-the-box. You do not need to configure it. Carry on from *Step 3: Specifying an AMT Server connection* on page 14.

In the following circumstances, however, you may need to configure *VNC Viewer Plus* before you connect:

- If the computer running *AMT Server* is Wi-Fi-enabled (for example, a laptop), and you want to restart that computer (perhaps to configure the BIOS), then you must give *AMT Server* control of the network interface card.
- If your network environment is configured for Kerberos, you may need to check that *VNC Viewer Plus* permits single sign-on.

To configure *VNC Viewer Plus* before you connect, click the **Options** button at the bottom of the **VNC Viewer Plus: New Connection** dialog box:

(Windows XP)

The **VNC Viewer Plus Properties** dialog opens. You may need to click the **Advanced** button to see all the tabs. For more information on this dialog, including a list of features that are not available for connections to *AMT Server*, and tabs unavailable after you connect, see *Using the VNC Viewer Plus Properties dialog* on page 27.

Restarting a Wi-Fi-enabled host computer

By default, the operating system of a Wi-Fi-enabled host computer has control of the network interface card while a connection is in progress. This means you are disconnected if you reset the host computer (that is, power it off and on again, or restart the operating system), and cannot reconnect until the operating system reboots and re-establishes a connection to a Wireless Access Point.

If you want to remain connected while a host computer restarts (a key *VNC Viewer Plus* feature), choose **The host computer can be controlled during a restart** on the **AMT Server** tab.

Note: Intel AMT must be enabled to manage Wi-Fi. See *Enabling Wi-Fi management* on page 40 for more information.

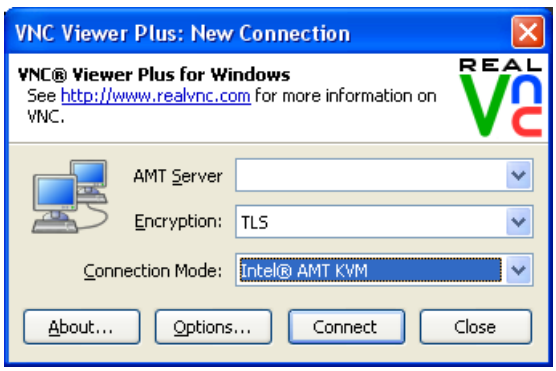
Permitting single sign-on

By default, *VNC Viewer Plus* permits single sign-on for a Kerberos-enabled network environment. This means you do not have to specify a user name and password in order to connect to *AMT Server*.

If you are unexpectedly presented with an authentication dialog when you connect to *AMT Server*, check that **Use single sign-on if VNC Server supports it** is turned on in the **Connection** tab.

Step 3: Specifying an AMT Server connection

By default, *VNC Viewer Plus* is set to make a standard VNC connection. To connect to *AMT Server*, choose `Intel® AMT KVM` from the **Connection Mode** dropdown on the **VNC Viewer Plus: New Connection** dialog box:



(Windows XP)

Step 4: Identifying AMT Server on the host computer

You must specify a network address that uniquely identifies *AMT Server* running on the host computer.

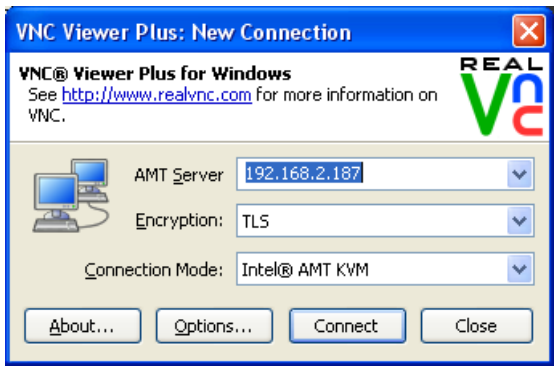
If you do not know a network address and you have access to the host computer, you may be able to find out. See *Discovering a network address* on page 39 for more information. If you do not have access to the host computer, you will need to ask your system administrator or a host computer user.

A network address can take the following forms:

- A friendly *host name* for the host computer, for example `johndoe`.
- An IP address for the host computer in IPv4 format, for example `192.168.2.187`.
- An IP address for the host computer in IPv6 format within square brackets, for example `[2001:db8::1]`.

Do not specify a port number. For information on ports, see *Making ports accessible* on page 39.

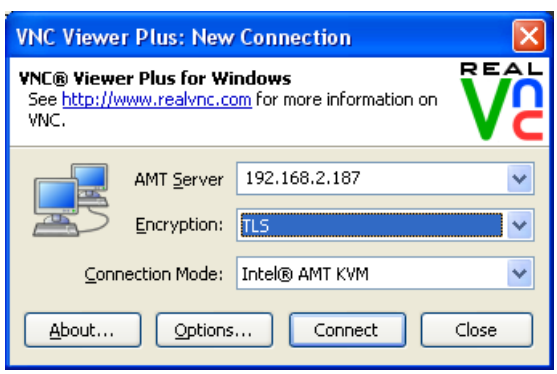
In the following picture, the host computer is identified by an IPv4 network address:



(Windows XP)

Step 5: Selecting an encryption option

To encrypt a connection to *AMT Server*, make sure `TLS` is selected in the **Encryption** dropdown on the **VNC Viewer Plus: New Connection** dialog box:



(Windows XP)

Note that:

- The host computer must be configured to use Transport Layer Security (TLS).
- A certificate from a Certification Authority must be installed on the client computer. See *Installing a certificate* on page 16 for more information.

To leave the connection unencrypted, choose `None`. Note that:

- The host computer must *not* be configured to use TLS.
- Your user name and password, as well as data transferred between the computers while the connection is in progress, are potentially susceptible to discovery by third parties.

If you do not know whether the host computer is configured to use TLS, and you have access to it, you may be able to find out. See *Setting up encrypted connections* on page 40 for more information. If you do not have access to the host computer, you will need to ask your system administrator or a host computer user.

Installing a certificate

To establish an encrypted connection to a host computer, a certificate must be installed on your client computer. This certificate attests to the legitimacy of the host computer. You only need perform this operation once.

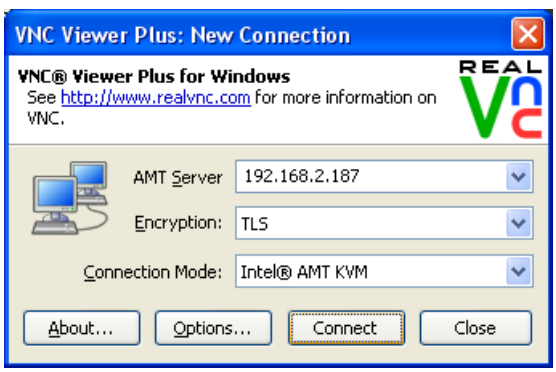
Note: If you do not have access to the host computer, you will need to ask your system administrator or a host computer user to provide you with a valid certificate. For more information, see *Setting up encrypted connections* on page 40.

To install a certificate on your client computer:

1. In Control Panel, choose **Internet Options**.
2. On the **Content** tab of the **Internet Properties** dialog, click the **Certificates** button.
3. In the **Certificates** dialog, click the **Import** button.
4. Complete the **Certificate Import** Wizard. On the **Certificate Store** page, choose **Place all certificates in the following store**, and browse to the **Trusted Root Certification Authorities** certificate store.

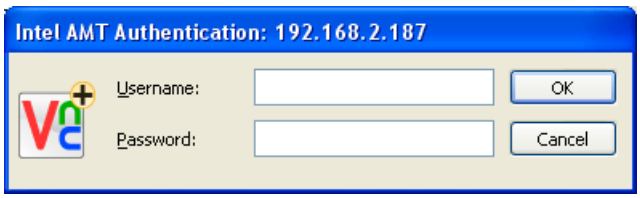
Step 6: Connecting to AMT Server

To connect to *AMT Server*, click the **Connect** button at the bottom of the **VNC Viewer Plus: New Connection** dialog:



(Windows XP)

You may be prompted to enter a user name and password:



(Windows XP)

If you:

- Do not know authentication credentials and you have access to the host computer, you may be able to find out. See *Discovering authentication credentials* on page 39 for more information. If you do not have access to the host computer, you will need to ask your system administrator or a host computer
- Are not *expecting* to enter authentication credentials, you may need to configure *VNC Viewer Plus* for single sign-on and then reconnect. See *Permitting single sign-on* on page 13 for more information.

You *may* also be prompted to enter a six-digit code:

You must contact a host computer user in order to obtain this code. For more information on this feature, see *Requiring host computer user consent* on page 41.

If the connection is successful, *VNC Viewer Plus* displays the current video output of the host computer in a new window on the client computer. Carry on from *The VNC Viewer Plus user experience* on page 22. If the connection fails for any reason, start with *Troubleshooting connection* on page 17.

Note: Once connected, you can save the connection so you can quickly reconnect in future without having to remember the network address and any authentication credentials. For more information, see *Saving the current connection* on page 35.

Troubleshooting connection

The following sections provide additional information to help you connect.

If after reading this you still cannot connect, or if you want more information, consult the RealVNC web site, or contact Support. For details of these resources, see *About This Guide* on page 5.

Connecting over the Internet

This User Guide assumes you are connecting over a private network such as a LAN or VPN, and that it is not necessary to configure internal firewalls or routers in order to establish a connection.

If you are connecting over the Internet, it is very likely that firewalls and routers protecting the host computer will need to be configured to allow and forward network communications to it. We recommend you read the

manufacturers' instructions. To see which ports must be accessible on the host computer, read *Making ports accessible* on page 39.

Connecting via a proxy server

In this release, *VNC Viewer Plus* cannot connect to *AMT Server* if the client computer is protected by a proxy server. You will need to bypass or disable the proxy server in order to connect. Contact your system administrator for more information.

VNC Viewer Plus can still make a standard VNC connection via a proxy server. For more information about configuring *VNC Viewer Plus* for proxy servers, see the *VNC Enterprise Edition User Guide*.

Error messages

If a connection fails, an error message is displayed. Some error messages are generated by *VNC Viewer Plus*; some by *AMT Server*.

Note: *AMT Server* is a product from Intel Corporation. RealVNC Limited has no control over, and can take no responsibility for, *AMT Server* functionality or behavior.

Connecting to a disabled host computer

If you see the following message:

```
KVM is disabled in Intel AMT. Please enable it and try again.
```

then *AMT Server* is disabled on the host computer. If you have access to the host computer, you may be able to enable it. See *Enabling AMT Server* on page 38 for more information. If you do not have access, you will need to ask your system administrator or a host computer user.

Failing to supply the correct network address

If you see the following message:

```
Connection failed. Check you have entered the correct address/hostname. Check
AMT Server is configured to allow TLS-secured connections.
```

then it may be that you have entered an incorrect IP address or host name in the **AMT Server** dropdown on the **VNC Viewer Plus: New Connection** dialog. Note it is possible for *AMT Server* to be assigned a different network address to that of the host computer's operating system.

If you do not know a network address and you have access to the host computer, you may be able to find out. See *Discovering a network address* on page 39 for more information. If you do not have access, you will need to ask your system administrator or a host computer user.

Failing to specify an encrypted connection

If you see the following message:

```
Connection failed. Check you have entered the correct address/hostname. Check
AMT Server is configured to allow unsecured connections.
```

then it may be that you have chosen `None` in the **Encryption** dropdown on the **VNC Viewer Plus: New Connection** dialog, yet the host computer is configured to use Transport Layer Security (TLS). You must choose `TLS` from this dropdown instead.

If you do not know whether the host computer is configured to use TLS, and you have access to it, you may be able to find out. See *Setting up encrypted connections* on page 40 for more information. If you do not have access, you will need to ask your system administrator or a host computer user.

Failing to provide a certificate for an encrypted connection

If you see the following message:

```
Security failure. The secure connection failed due to an invalid or missing
certificate (12175).
```

then you are connecting to a host computer configured to use Transport Layer Security (TLS), but your client computer either:

- Does not have a security certificate.
- Has a security certificate but it is not in the correct certificate store.
- Has a certificate in the correct store but it is not valid for some reason.

For more information, start with *Installing a certificate* on page 16.

Failing to specify an unencrypted connection

If you see the following message:

```
Connection failed. Check you have entered the correct address/hostname. Check
AMT Server is configured to allow TLS-secured connections.
```

then it may be that you have chosen `TLS` in the **Encryption** dropdown on the **VNC Viewer Plus: New Connection** dialog, yet the host computer is *not* configured to use Transport Layer Security (TLS). You must choose `None` from this dropdown instead.

If you do not know whether the host computer is configured to use TLS, and you have access to it, you may be able to find out. See *Setting up encrypted connections* on page 40 for more information. If you do not have access, you will need to ask your system administrator or a host computer user.

Failing to authenticate correctly

If you see the following message:

```
Either the user name was not recognised, or the password was incorrect.
```

then you have incorrectly entered authentication credentials. Note that both user name and password are case-sensitive.

If you do not know the authentication credentials and you have access to the host computer, you may be able to find out. See *Discovering authentication credentials* on page 39 for more information. If you do not have access, you will need to ask your system administrator or a host computer user

Connecting while another VNC Viewer Plus user is connected

If you see the following message:

```
AMT Server is currently busy serving a session to another viewer, please try
again later.
```

then you cannot connect until another *VNC Viewer Plus* has disconnected. Only one *VNC Viewer Plus* user can connect to *AMT Server* at a time.

AMT Server errors

It is possible that you might see error messages with `Wsman` or `KVMLib` in the dialog title or text.

These errors are generated by *AMT Server*, and are complex to diagnose. The recommended procedure is to wait a few moments and attempt to reconnect.

3

Using VNC Viewer Plus

This chapter explains how to use *VNC Viewer Plus* to control a host computer running *AMT Server*.
If you are not yet connected, read *Chapter 2, Getting Connected* on page 11.

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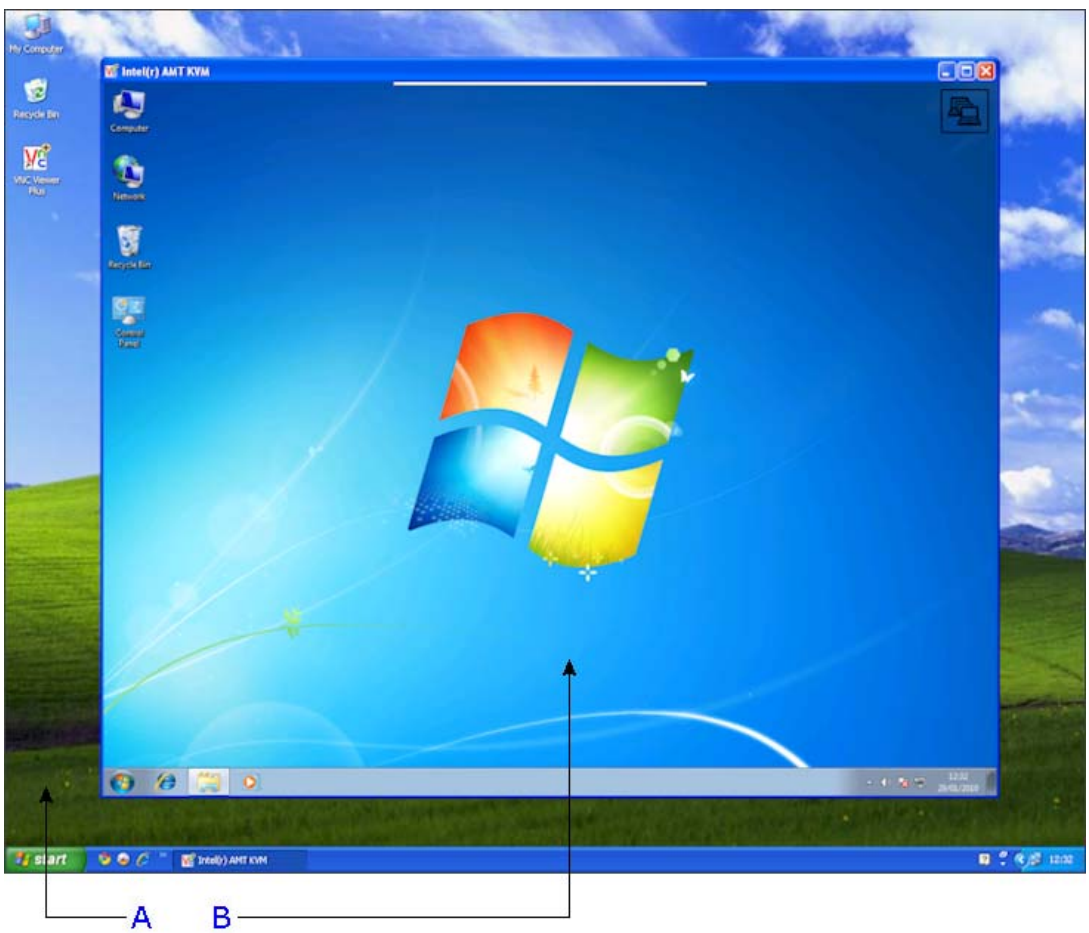
The VNC Viewer Plus user experience

When a connection is established, *VNC Viewer Plus* displays a new window on the client computer displaying video output from the host computer running *AMT Server*:

- If the host computer is powered off, or in hibernate mode, or has no functioning operating system, the screen will likely be black. To power the computer on, click the **Power** *VNC Viewer Plus* toolbar button.
- If the host computer is powered on and has more than one monitor, a connection screen will likely be displayed prompting you to choose which monitor to remote. Press the F1 key to toggle between monitors, and then the ENTER key to continue (your mouse is disabled on this screen).
- If the host computer is powered on and an operating system is booted, the desktop of the host computer will likely be shown, or a login screen if no host computer user is currently logged on.



A. *Desktop of a client computer running Windows XP.* **B.** *VNC Viewer Plus displaying the desktop of a host computer.*

Note: The graphic in the top right corner of the *VNC Viewer Plus* window flashes to indicate that a *VNC Viewer Plus* user is connected. Note this graphic is monochrome so may not be visible when the screen is black.

Controlling the host computer using your mouse

Your client computer's mouse is now shared with the host computer. This means that:

- Moving the mouse and clicking within the *VNC Viewer Plus* window affects the host computer and not your client.
- Moving the mouse and clicking outside the *VNC Viewer Plus* window, or on the *VNC Viewer Plus* title bar or window buttons (**Minimize**, **Maximize**, and **Close**), affects your client computer and not the host.

Note: If your mouse has no effect on the host computer, it may have been disabled. For more information, see *Restricting access to VNC Viewer Plus functionality* on page 33. Alternatively, it may be that the host computer is not accepting mouse input in its current state.

If client and host computers have different numbers of mouse buttons, you can configure *VNC Viewer Plus* to emulate those you do not have. See *Changing the appearance and behavior of VNC Viewer Plus* on page 31 for more information.

Controlling the host computer using your keyboard

Your client computer's keyboard is now shared with the host computer, with the exception of:

- The function key that opens the shortcut menu (F8 by default)
- The CTRL-ALT-DELETE key combination.

These are interpreted by your client computer. Alternative ways of sending these commands to the host computer are available; see *Using the VNC Viewer Plus shortcut menu* on page 26 for more information.

Note that if you prefer certain keys or key combinations to be interpreted by your client computer instead of the host, see *Changing the appearance and behavior of VNC Viewer Plus* on page 31.

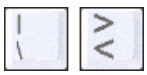
Note: If your keyboard has no effect on the host computer, it may have been disabled. For more information, see *Restricting access to VNC Viewer Plus functionality* on page 33.

Note that *AMT Server* interprets keyboard keys slightly differently to *VNC Server*. For a connection to *VNC Server*, *VNC Viewer Plus* reproduces what you type exactly. For a connection to *AMT Server*, however, it is first necessary to ensure that the keyboard language of the host computer is mapped to the type of keyboard attached to your client computer. For example, if you have a UK keyboard, you should ensure that the host computer's keyboard language is set to `English (United Kingdom)`.

Note: You can change the keyboard language of a host computer running Windows 7 by navigating to **Region and Language** in Control Panel. (For other operating systems, consult the manufacturer's documentation.)

Note also the following issues:

- If your client computer has a 102 key European-style keyboard, you cannot press the key next to the left SHIFT key. Depending on your keyboard, this may be one of the following keys:

  Instead, to enter these characters, you must first change the host computer's keyboard language to `English (United States)`, and then press the key on your keyboard corresponding to the key that you *would* press were you to have a 101 key US-style keyboard. For example:

  — If you have a UK keyboard, press `#` and `~` (`SHIFT-#`) to enter the `\` and `|` characters respectively.

  — If you have a French keyboard, press `.` (`SHIFT-;`) and `/` (`SHIFT-:`) to enter the `<` and `>` characters respectively.

- If your client computer has a 106 key Japanese-style keyboard, you cannot press the following keys:

  Note that the last three of these keys are located either side of the space bar.

A future release of Intel AMT firmware should resolve these issues.

Interacting with AMT Server

AMT Server is embedded in hardware so there is no Notification area icon or other facet in software to indicate status as there is with *VNC Server*. You cannot configure *AMT Server* over the network using *VNC Viewer Plus*.

If you have access to the host computer, or remote management or provisioning tools, you may be able to configure *AMT Server*. See *Chapter 4, Configuring the host computer* on page 37 for more information.

Using the VNC Viewer Plus toolbar

VNC Viewer Plus has a toolbar to facilitate common operations.

Note: If you cannot access the *VNC Viewer Plus* toolbar, it may have been disabled. For more information, see *Changing the appearance and behavior of VNC Viewer Plus* on page 31.

To see the toolbar, hover the mouse over the hot area at the top of the *VNC Viewer Plus* window:

(Windows XP)

The following table explains the effect of clicking each toolbar button.

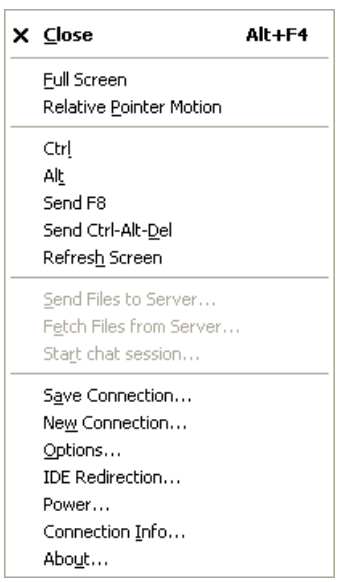
	Button name	Explanation
	New Connection	Opens the **VNC Viewer Plus: New Connection** dialog. You can start a new connection to *AMT Server* running on a different host computer, or to a VNC-compatible Server running on any computer.
	Save Connection	You can save the current connection so you can quickly reconnect in future without having to remember the *AMT Server* network address and authentication credentials. For more information, see *Saving the current connection* on page 35.
	Close Connection	Prompts you to close the current connection (and the *VNC Viewer Plus* window).
	Options	Opens the **VNC Viewer Plus Properties** dialog. You can configure most aspects of *VNC Viewer Plus* while the current connection is in progress. For more information, see *Using the VNC Viewer Plus Properties dialog* on page 27.
	Full Screen Mode	Toggles full screen mode on and off.
	Send Ctrl-Alt-Del	Sends the CTRL-ALT-DELETE command to the host computer. (Pressing this key combination would be interpreted by the client computer.) You could alternatively press SHIFT-CTRL-ALT-DELETE.
	Send Files To VNC Server	This feature is disabled when connected to a host computer running *AMT Server*.
	Fetch Files From VNC Server	This feature is disabled when connected to a host computer running *AMT Server*.
	Start Chat Session	This feature is disabled when connected to a host computer running *AMT Server*.
	IDE Redirection	Opens the **IDE Redirection** dialog. For more information, see *Mounting an ISO image on the host computer* on page 29.
	Power	Opens the **Power** dialog. For more information, see *Powering the host computer on and off* on page 28.
	Connection Information	Opens a dialog displaying technical information about the current connection, such as the encryption method and compression format.
	encryption	The connection is encrypted/not encrypted (only one of these buttons is shown).
	connection speed/ activity	Hovering over this toolbar button reveals the current connection speed. For more information on performance, see *Changing the appearance and behavior of VNC Viewer Plus* on page 31.

Using the VNC Viewer Plus shortcut menu

VNC Viewer Plus has a shortcut menu that facilitates many of the same common operations as the *VNC Viewer Plus* toolbar. (For more information on this, see *Using the VNC Viewer Plus toolbar* on page 24.)

Note: If you cannot access the *VNC Viewer Plus* shortcut menu, it may have been disabled. For more information, see *Changing the appearance and behavior of VNC Viewer Plus* on page 31.

By default, to open the shortcut menu, press the F8 key:



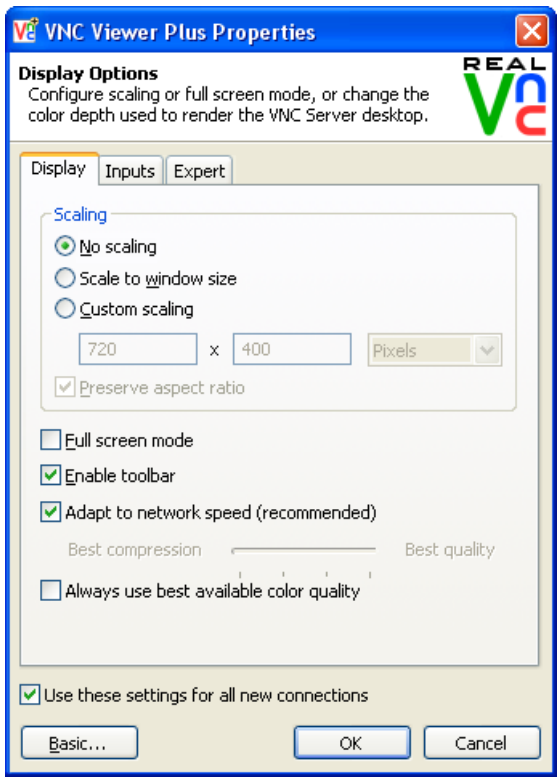
(Windows XP. Some standard Windows menu options have been omitted.)

The following table explains the effect of selecting menu options that do not have equivalent toolbar buttons.

Shortcut menu option	Explanation
Relative Pointer Motion	Turn this option on if the host computer's mouse cursor appears to be behaving abnormally, for example by accelerating too fast.
Ctrl	Turn this option on to simulate holding down the CTRL key.
Alt	Turn this option on to simulate holding down the ALT key.
Send F8	Sends an F8 command to the host computer. (By default, F8 opens the shortcut menu; see *Changing the VNC Viewer Plus shortcut menu key* on page 33 for information on choosing a different key.) You could alternatively press F8 twice in quick succession.
Refresh Screen	Refreshes the display of the host computer's desktop.
About	Displays *VNC Viewer Plus* version information. You may need this if you contact Support.

Using the VNC Viewer Plus Properties dialog

The **VNC Viewer Plus Properties** dialog enables you to configure *VNC Viewer Plus* while a connection is in progress.



(Windows XP. In this picture, the dialog is in Advanced mode.)

To open the **VNC Viewer Plus Properties** dialog, click the **Options** toolbar button, or select **Options** from the shortcut menu. (If the *VNC Viewer* toolbar or shortcut menu are not accessible, see *Changing the appearance and behavior of VNC Viewer Plus* on page 31.)

The first time you open this dialog, it opens in Basic mode, and only one tab is available, containing the most common properties. Click the **Advanced** button in the bottom left corner to switch to Advanced mode and see all the tabs in the picture above. Note that the **Expert** tab is recommended for expert users only.

By default, any changes you make apply both to the current connection *and to all future connections to any host computer*. To apply changes just to the current connection, turn off **Use these settings for all new connections** first.

Note that properties on the **Inputs** tab relating to the following features are not available for connections to *AMT Server*:

- File transfer

- Copy and paste text
- *VNC Chat*

Note also that certain properties must be configured before you connect. For more information, see *Step 2: Configuring VNC Viewer Plus before you connect* on page 12.

Powering the host computer on and off

You can use *VNC Viewer Plus* to:

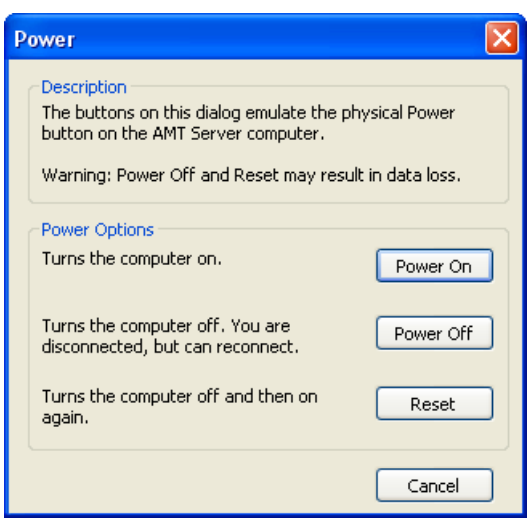
- Power the host computer on. Note doing so can also wake the host computer from hibernate mode.
- Power the host computer off. Note that data may be lost. You are disconnected, but are immediately prompted to reconnect without having to enter a user name and password (actually *establishing* the connection, however, may take several moments).

  Note: This option is disabled if an image is currently mounted. For more information, see *Mounting an ISO image on the host computer* on page 29.
- Power the host computer off and on again. Note that data may be lost. Note also that this is not the same as restarting an operating system. An operating system may subsequently complain that it was not shut down properly when the host computer powers on.

  You remain connected throughout the power cycle, and can press appropriate keyboard key(s) at the appropriate moment to configure the BIOS. Note, however, that you cannot configure *AMT Server* using *VNC Viewer Plus*. See *Chapter 4, Configuring the host computer* on page 37 for more information.

  Note: If you are disconnected during a power cycle, it may be that *VNC Viewer Plus* must be configured for Wi-Fi. For more information, see *Restarting a Wi-Fi-enabled host computer* on page 13.

To perform these operations, click the **Power** toolbar button. The **Power** dialog opens:


Power
Description
The buttons on this dialog emulate the physical Power button on the AMT Server computer.
Warning: Power Off and Reset may result in data loss.
Power Options
Turns the computer on.
Power On
Turns the computer off. You are disconnected, but can reconnect.
Power Off
Turns the computer off and then on again.
Reset
Cancel

(Windows XP)

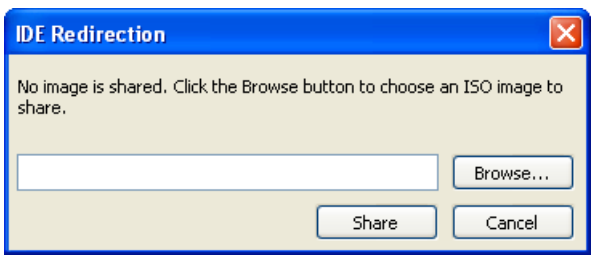
Mounting an ISO image on the host computer

You can use *VNC Viewer Plus* to mount an ISO image (representing a CD or DVD drive) on the host computer. This image is automatically:

- Set as the first in the boot sequence, so when the host computer next powers on you can (for example, and providing the image is bootable) install an operating system over the network.
- Registered as a drive, so when the host computer next powers on you can (for example, and providing the host computer has an operating system) navigate to an `E:\` drive in File Explorer or similar.

Note: This feature is known as IDER(edirection). It must be enabled in Intel AMT. See *Enabling IDE Redirection (IDER)* on page 40 for more information.

To mount an image, click the **IDE Redirection** toolbar button. The **IDE Redirection** dialog opens:



(Windows XP)

Browse to a valid ISO file and click the **Share** button. The dialog automatically closes. In order to:

- Boot from the image, click the **Power** toolbar button and then **Power On** or **Reset** (depending on the state of the host computer) in order to power the host computer on. If the image is bootable, the appropriate action is automatically performed. If not, the image is ignored.
- Navigate to the drive, click the **Power** toolbar button and then **Power On** or **Reset** (depending on the state of the host computer) in order to power the host computer on. You can now navigate through using File Explorer or similar.

  Note you need only restart in order to register a drive the first time in a *VNC Viewer Plus* session. Subsequently, you can remove an image and mount a new one without having to power cycle. This means you can (for example) install a program on the host computer that is distributed over multiple CDs.

An image remains mounted until you explicitly dismount it. This means that:

- If you disconnect, or are disconnected due to inactivity, another newly-connected *VNC Viewer Plus* user cannot mount an image until you have acknowledged the disconnection warning dialog.
- You cannot click the **Power** toolbar button and then **Power Off** to power the host computer off. See *Powering the host computer on and off* on page 28 for more information.

To remove an image, click the **IDE Redirection** toolbar button to open the **IDE Redirection** dialog, and then the **Remove** button.

Managing the current connection

You can manage aspects of the current connection while it is in progress.

Note: The operations described in this section are facilitated by the *VNC Viewer Plus* toolbar. For more information on this, see *Using the VNC Viewer Plus toolbar* on page 24.

Saving the current connection

You can save the current connection so you can quickly reconnect in future without having to remember the network address and your authentication credentials. In addition, your preferred *VNC Viewer Plus* environment for controlling the host computer is automatically recreated.

To save the current connection, click the **Save Connection** toolbar button. Carry on from *Saving the current connection* on page 35.

Starting a new connection

You can start a new connection to *AMT Server* running on a different host computer, or to a VNC-compatible Server running on any host computer. To do this, click the **New Connection** toolbar button. The **VNC Viewer Plus: New Connection** dialog opens. Carry on from *Step 1: Starting VNC Viewer Plus on the client computer* on page 12.

By default, any properties you have configured are inherited by the new connection. To prevent this, open the **VNC Viewer Plus Properties** dialog and turn off **Use these settings for all new connections** first. For more information on this dialog, see *Using the VNC Viewer Plus Properties dialog* on page 27.

Closing the current connection

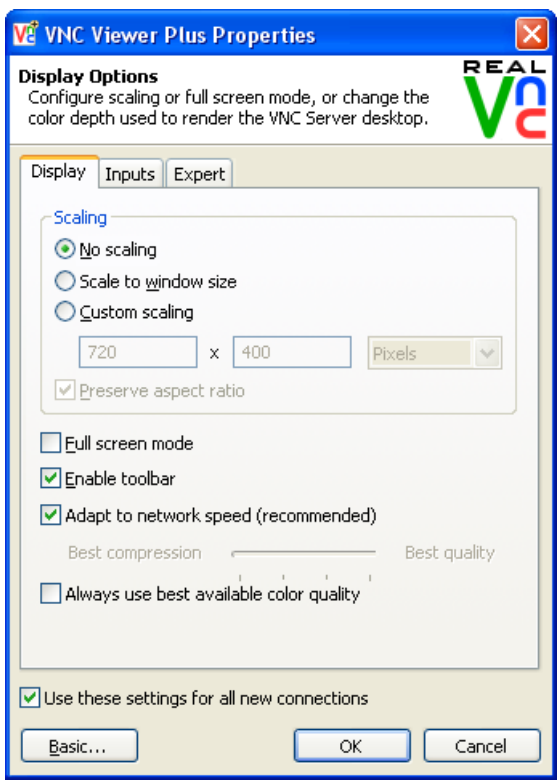
You can quickly close the current connection. To do this, click the **Close Connection** toolbar button. You are prompted to confirm the operation before the *VNC Viewer Plus* window closes.

Changing the appearance and behavior of VNC Viewer Plus

By default, when a connection is established:

- *VNC Viewer Plus* does not scale the host computer's desktop. Instead, scroll bars are added to the window if the desktop is too large.
- *VNC Viewer Plus* displays the host computer's desktop at a color quality appropriate to the network connection speed.
- Your mouse and keyboard are set to interact with the client and host computers in particular ways.
- The *VNC Viewer Plus* window is set to a particular size.
- The *VNC Viewer Plus* toolbar is accessible.
- The *VNC Viewer Plus* shortcut menu is accessible (by pressing F8).

You can change these defaults by configuring properties on the **Display** tab of the **VNC Viewer Plus Properties** dialog. For more information on this dialog, see *Using the VNC Viewer Plus Properties dialog* on page 27.



(Windows XP)

Scaling the host computer's desktop

You can scale the host computer's desktop, which might make it easier to navigate and to use.

To scale the desktop to the size of the *VNC Viewer Plus* window, choose **Scale to window size**.

To scale it to a custom size, choose **Custom scaling**, and specify a width and height for the *VNC Viewer Plus* window. Turn on **Preserve aspect ratio** to automatically calculate a height for a given width, and *vice versa*. Note you cannot resize a custom-sized *VNC Viewer Plus* window using your mouse.

Trading performance for picture quality

You may be able to enhance the performance of *VNC Viewer Plus* by reducing the number of colors used to display the host computer's desktop. To do this, turn off **Adapt to network speed (recommended)**, and move the slider towards **Best compression**.

If you want to enhance performance but retain full color, turn on **Always use best available color quality**. Performance is enhanced by other means, for example by reducing the amount of information sent about the mouse cursor's position. Note this may make mouse cursor movements appear jerky on the host computer.

Note: You can explicitly reduce the amount of mouse cursor position information sent by turning on **Rate-limit mouse move events**. This property is on the **Inputs** tab. This may also be useful if you are connecting over a mobile or dial-up network.

Configuring your mouse

You can emulate buttons missing because your mouse has fewer buttons than the host computer's mouse.

To do this, turn on **Enable 3-button mouse emulation**. To emulate the missing middle button, click the left and right mouse buttons simultaneously. Note this property is on the **Inputs** tab.

Configuring your keyboard

By default, and with the exception of CTRL-ALT-DELETE and the function key used to open the shortcut menu, key presses affect the host computer and not the client. To reverse this behavior for the application-level keys listed below, turn off **Pass special keys directly to VNC Server**. Note this property is on the **Inputs** tab.

Affected keys/combinations: WINDOWS (also known as START), PRINT SCREEN, ALT-TAB, ALT-ESCAPE, CTRL-ESCAPE.

Changing the size of the VNC Viewer Plus window

You can use the mouse to resize the *VNC Viewer Plus* window in the expected way for the platform of the client computer. The window's Application buttons (**Minimize**, **Maximize**, and **Close**) also work in the expected way.

To toggle full screen mode on and off, click the **Full Screen Mode** *VNC Viewer Plus* toolbar button.

Disabling the VNC Viewer Plus toolbar

You can disable the *VNC Viewer Plus* toolbar. (For more information, see *Using the VNC Viewer Plus toolbar* on page 24.) To do this, turn off **Enable toolbar**.

Note that if you disable the *VNC Viewer Plus* shortcut menu as well you will not be able to access the *VNC Viewer Plus* toolbar again while the current connection is in progress.

Disabling the VNC Viewer Plus shortcut menu

You can disable the *VNC Viewer Plus* shortcut menu. (For more information, see *Using the VNC Viewer Plus shortcut menu* on page 26.) To do this, select `none` from the **Menu key** dropdown. Note this property is on the **Inputs** tab.

Note that if you disable the *VNC Viewer Plus* toolbar as well you will not be able to access the *VNC Viewer Plus* shortcut menu again while the current connection is in progress.

Changing the VNC Viewer Plus shortcut menu key

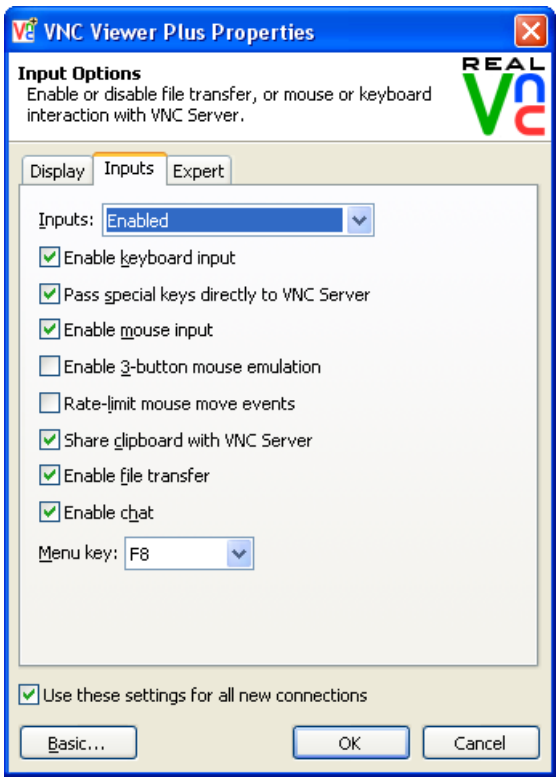
You can change the function key used to open the shortcut menu. To do this, select a function key from the **Menu key** dropdown. Note this property is on the **Inputs** tab. The shortcut menu updates to reflect the fact that you can no longer press the chosen key to send that command to the host computer.

Restricting access to VNC Viewer Plus functionality

By default, while a connection is in progress, and assuming the host computer is in a state to accept keyboard and mouse input, you should be able to control the host computer using the client computer's keyboard and mouse.

You can restrict access to *VNC Viewer Plus* functionality while the connection is in progress by configuring properties on the **Inputs** tab of the **VNC Viewer Plus Properties** dialog. For more information on this dialog, see *Using the VNC Viewer Plus Properties dialog* on page 27. You might want to do this if you are watching a demonstration on the host computer, for example, and want to prevent inadvertent interruption.

Note: You can enable functionality again at any time. To prevent this for the current connection only, disable the *VNC Viewer Plus* toolbar and shortcut menu. For more information, see *Changing the appearance and behavior of VNC Viewer Plus* on page 31.



(Windows XP)

Making VNC Viewer Plus 'view only'

You can quickly prevent all interchange with the host computer, making *VNC Viewer Plus* 'view only'. To do this, select `Disabled (view-only mode)` from the **Inputs** dropdown.

Disabling your keyboard

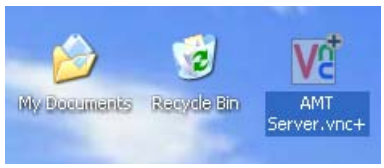
You can disable the client computer's keyboard. To do this, turn off **Enable keyboard input**.

Disabling your mouse

You can disable the client computer's mouse. To do this, turn off **Enable mouse input**.

Saving the current connection

You can save the current connection to a desktop icon on the client computer:



(Windows XP)

A desktop icon provides an extremely quick and convenient way of reconnecting to a host computer. Simply double-click the icon to connect. The *AMT Server* network address and any user name and password are remembered, so you do not have to, and your preferred *VNC Viewer Plus* environment for controlling the host computer is automatically recreated each time.

To save the current connection to a desktop icon:

1. In *VNC Viewer Plus*, click the **Save Connection** toolbar button.
2. If you entered a password in order to connect to *AMT Server*, you are prompted to save it. Note that doing so may constitute a security risk, since the password is saved in obfuscated, though not encrypted, form. If you do not save the password, you must enter it each time you connect.
3. Choose a location to save the icon file to (for example, the desktop), and an intuitive name.

4

Configuring the host computer

This chapter explains how to configure the host computer running *AMT Server* to best work with *VNC Viewer Plus*, and assumes you have sufficient privileges to do so.

Note: *AMT Server* is a product from Intel Corporation. RealVNC Limited has no control over, and can take no responsibility for, *AMT Server* functionality or behavior.

You cannot configure *AMT Server* over the network using *VNC Viewer Plus*. You must either have access to the host computer, or remote management or provisioning tools from Intel Corporation.

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Setting up Intel AMT

AMT Server is managed by Intel Active Management Technology (Intel AMT), through Intel Management Engine BIOS Extension (MEBX). You must set up Intel AMT for KVM (Keyboard, Video, Mouse) operations before you can enable *AMT Server*.

To do this:

1. Power the host computer on. At the appropriate moment, press the CTRL-P key combination to enter Intel ME Setup.
2. Enter the Intel ME account password. By default, this is `admin`.

   The default should be changed to a password of at least eight characters, containing a capital letter, lower case letter, digit, and a special character from the following: `( ! @ # $ % ^ & * )`

   Note this password (and the Intel ME account user name, which is `admin` by default) can be distributed to a *VNC Viewer Plus* user in order to connect. For more information, see *Discovering authentication credentials* on page 39.
3. Choose **Intel ME General Settings > Network Setup > Intel ME Network Name Settings**.
4. To:
   - — Specify a friendly name for the host computer, choose **Host Name**.
   - — Specify a network for the host computer to join, choose **Domain Name**.
   - — Share a host name between *AMT Server* and an operating system, make sure **Shared/Dedicated FQDN** is set to **Shared**.
   - — Prevent the host name changing, make sure **Dynamic DNS Update** is set to **Disabled**.
5. Exit and save your settings.

Enabling AMT Server

You must configure Intel AMT to enable *AMT Server* before a *VNC Viewer Plus* user can connect. To do this:

1. Enter Intel ME Setup. To see how to do this, read *Setting up Intel AMT* on page 38.
2. Choose **Intel AMT Configuration**, and press the ENTER key to dismiss the `Update network settings in the General Settings menu` warning.
3. Make sure **KVM Configuration > KVM Feature Selection** is set to **Enabled**.
4. Exit and save your settings.

Discovering a network address

A *VNC Viewer Plus* user must enter a network address uniquely identifying *AMT Server* running on the host computer in order to connect.

AMT Server can be specified a host name, or assigned an IP address. To see whether a host name is specified, follow the instructions in *Setting up Intel AMT* on page 38. Note that a *VNC Viewer Plus* user may have to qualify the host name with a domain name in order to connect.

If *AMT Server* does not have a host name, then it may be assigned the same IP address as the host computer's operating system. To find out what this is, boot the operating system and use a tool such as `ipconfig` (Windows) or `ifconfig` (UNIX).

If the host computer does not have an operating system, ask your system administrator.

Discovering authentication credentials

A *VNC Viewer Plus* user may be required to enter a user name and password in order to connect to *AMT Server*. If so, these must be the credentials of an Intel AMT *administrative user*.

Note: Authentication credentials are not required if the network environment is configured for Kerberos. The credentials supplied by the *VNC Viewer Plus* user in order to log on to the client computer are also used to connect to *AMT Server*. Note this user must have Intel AMT administrative user privileges in order to use all the features of *VNC Viewer Plus*.

You can distribute the credentials of the Intel ME account to *VNC Viewer Plus* users in order to connect. See *Setting up Intel AMT* on page 38 for more information. If you do not want to do this, then create a new Intel AMT administrative user account and distribute these credentials instead. You may be able to do this remotely using web-based management tools, for example by navigating to:

- https://<network address>:16993/index.htm for a host computer configured to use Transport Layer Security (TLS).
- http://<network address>:16992/index.htm for a host computer *not* configured to use TLS.

For more information on TLS, see *Setting up encrypted connections* on page 40.

Making ports accessible

Intel AMT requires the following ports to be accessible on the host computer:

- 16993 and 16995 (for encrypted connections)
- 16992 and 16994 (for unencrypted connections)

Note that firewalls or routers protecting the host computer (if applicable) must be configured to allow and forward network communications to it on these ports in order for a *VNC Viewer Plus* user to connect.

Setting up encrypted connections

To encrypt communications between a client computer running *VNC Viewer Plus* and a host computer running *AMT Server*:

- Transport Layer Security (TLS) must be enabled on the host computer.
- A security certificate must be deployed to the host computer.
- A certificate from a Certification Authority (CA) attesting to the legitimacy of the host computer's security certificate must be deployed to the client computer running *VNC Viewer Plus*.

To enable TLS, generate certificates, and deploy the certificate to the host computer, use Manageability Commander Tool provided with Intel Corporation's Manageability Developer Tool Kit. For more information, start with http://software.intel.com/en-us/articles/download-the-latest-version-of-manageability-developer-tool-kit/.

To deploy a certificate to a client computer, a *VNC Viewer Plus* user must follow the instructions in *Installing a certificate* on page 16.

Enabling IDE Redirection (IDER)

You must configure Intel AMT to enable IDER before a *VNC Viewer Plus* user can mount an image. To do this:

1. Enter Intel ME Setup. To see how to do this, read *Setting up Intel AMT* on page 38.
2. Choose **Intel AMT Configuration**, and press the ENTER key to dismiss the `Update network settings in the General Settings menu` warning.
3. Make sure **SOL/IDER > IDER** is set to **Enabled**.
4. Exit and save your settings.

Enabling Wi-Fi management

If the host computer is Wi-Fi-enabled, you must enable Intel AMT to manage Wi-Fi connectivity so a *VNC Viewer Plus* user can perform key operations such as mounting an image and restarting. You may be able to do this remotely using web-based management tools, for example by navigating to:

- https://<network address>:16993/index.htm for a host computer configured to use Transport Layer Security (TLS).
- http://<network address>:16992/index.htm for a host computer *not* configured to use TLS.

On the **Wireless Settings** page, set **Wireless Management** to **Enabled in S0, Sx/AC**.

Requiring host computer user consent

You can require a *VNC Viewer Plus* user to enter a six-digit access code in order to complete the connection. This code is displayed to a host computer user but not to a *VNC Viewer Plus* user. The *VNC Viewer Plus* user must communicate separately with the host computer user in order to ascertain the code.

To do this:

1. Enter Intel ME Setup. To see how to do this, read *Setting up Intel AMT* on page 38.
2. Choose **Intel AMT Configuration**, and press the ENTER key to dismiss the `Update network settings in the General Settings menu` warning.
3. Make sure **KVM Configuration > User Opt-in** is set to **User Consent is required for KVM Session**.
4. Exit and save your settings.